



# GUIDELINES FOR PUP AUTHORS FOR PREPARING & SUBMITTING ILLUSTRATIONS

Last revised 1/03/10

**I**llustrations represent an important component of your book: they convey information and play a highly visible role in your book's impact on its readers. PUP authors are responsible for providing usable, final-quality illustrations that are stylistically consistent and have a professional appearance.

This guide is designed to help you submit illustrations that comply with PUP's aesthetic and format requirements. It covers the more common illustration tasks and some basic illustration concepts. You do not have to read the entire guide in order to get the information you need. **Note that the table of contents is linked to the text; you can go directly to any section by clicking on the heading.**

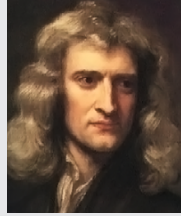
Some of the sections, such as ABOUT COLOR, GRAYSCALE & LINE ART, contain general information that may help you understand publishing requirements. Other sections contain practical advice on art preparation. The distinction between vector and raster art is given special attention due to its importance for printing and publishing.

If you have any questions regarding your art or the guidelines, contact the PUP illustration specialist through your editor or your editorial assistant.

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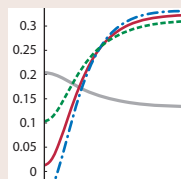
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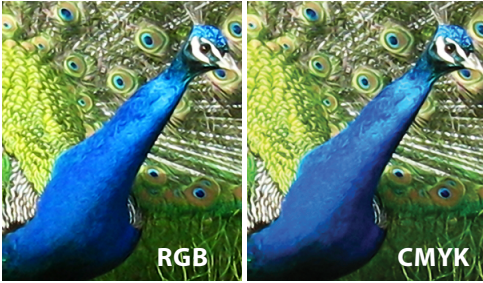
## PRELIMINARY ART REVIEW BY PUP

**Please submit preliminary art samples at your earliest convenience. Addressing potential problems early on is likely to save you time and unnecessary effort, and to avoid delays in your book's production.**

Send the art samples to your editor or editorial assistant. He/she will have them evaluated by the PUP illustration specialist.

If you are hiring an illustrator, make sure he/she is familiar with these guidelines. Send an art sample produced by your illustrator before proceeding with the rest of your figures. We recommend hiring illustrators specialized in book publishing. If you are working with multiple contributors, please submit a sample from each contributor. If you are working on various types of art, e.g., maps, photos, color art, b/w art, etc., submit a sample of each type of art.

# ABOUT COLOR, GRAYSCALE & LINE ART



*Some of the brighter RGB colors do not translate well to printing; compare the blue tones in RGB and CMYK.*

**NOTE** 🧐 Though grayscale and line art images are often referred to collectively as b/w, **the distinction between the two is very important for printing.**

Line art reproduced in a book is usually a very close copy of the original; the printing process is relatively simple, because line art is essentially very simple.

The process of reproducing grayscale (or color) art is more complex; it involves additional steps that significantly alter the art.

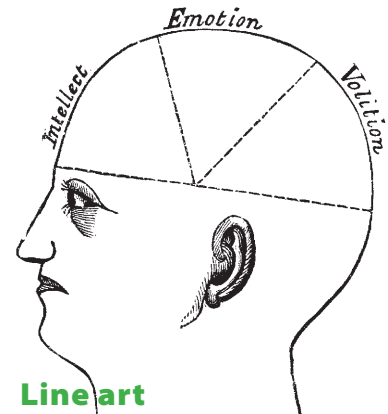
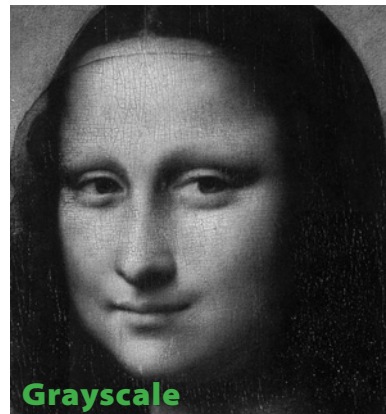
Here are the more common color systems and image types in the context of printing.

**RGB** is a very wide spectrum color system based on **R**ed, **G**reen, and **B**lue emitted color lights. Your monitor display uses RGB color system.

**CMYK** is the printing color system based on four standard printing inks: **C**yan, **M**agenta, **Y**ellow, and **blacK**. It does not include some of the brighter colors available in RGB color system.

**Grayscale** graphics are limited to black, white, and a range of gray tones. Color and grayscale images are referred to as **continuous-tone** images because they have a wide range of intermediate tones.

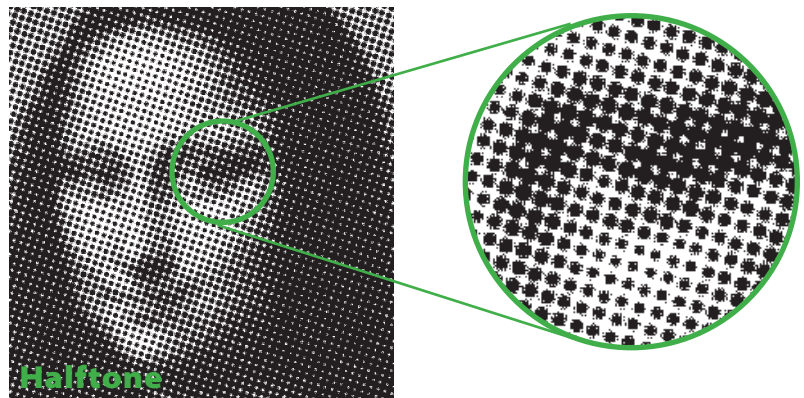
**Line art**, a.k.a. binary images, uses only black and white without grays.



In order to reproduce a grayscale image, the printer has to emulate hundreds of gray tones using a single black ink. To accomplish this, printers transform grayscale images into printable line images using the process called **halftoning**. The converted images are referred to as **halftones**. The halftones are composed of dots: dark areas use large dots; light areas use smaller dots. At a distance the dots blend and produce the illusion of smooth tonal transitions.



*Color halftones are composed of four halftone screens (one for each CMYK ink).*



*A halftone is composed of black dots arranged in a grid. Note that the original grayscale tones are lost.*

# BASIC DIGITAL ART REQUIREMENTS

Here are some basic guidelines for digital art.

<b>A</b>	<ul style="list-style-type: none"><li>swe1-1.eps</li><li>swe1-2.tif</li><li>swe5-1.eps</li><li>swe5-2.tif</li><li>swe12-1.tif</li></ul>	<b>B</b>	<ul style="list-style-type: none"><li>5-point.corrected</li><li>biosphere/blue.bmp</li><li>biosph,blue.tif</li><li>cont/(blg)</li><li>corp?3364.ps</li></ul>
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*File directory A clearly identifies each file by chapter and figure number.*

*File directory B shows unacceptable inconsistent file names, missing the vital information about the author, chapter number, figure number, and file extensions.*

- Do not submit Web links in lieu of files. The figures should be submitted as individual separate files segregated in a folder separate from the text.
- The **file names should be consistent** and brief, providing the placement data for the book production: the initial few letters of the author's name, followed by the chapter number, a dash, and the figure number: for example, "**smit2-10.eps**". The words "chapter" or "figure" are redundant. If it is useful to you, it is OK to add an abbreviated title after the number, for example: "**smit11-25\_seascape.tif**". Use only basic alphanumeric characters and underscores, without spaces or periods other than a period preceding the file extension.
- Files created in professional graphic applications produce the best results. **Adobe Illustrator is the preferred application for diagrams, maps, etc.;** see [VECTOR ART](#) guidelines. **Adobe PhotoShop is the preferred application for scanned art and digital photos;** see [RASTER ART](#).
- Placing figures in Word and other applications changes the images and makes them problematic for publishing. Submit the **original individual image files** for each illustration. A Word file with placed illustrations is useful only as a rough image placement reference within the text.
- Illustrations created in Microsoft Office and most other applications are not acceptable as final art; however, they can be helpful if you decide to have your art redrawn professionally. In some cases we can accept your printouts as camera-ready art; see [CAMERA-READY ART](#).
- If you engage professional illustrators or contributors to create or scan art, please familiarize them with PUP guidelines before they start on the art. Review and approve the art before sending it to us. Note that printouts generally give a better idea of how the art will reproduce in a book than does your monitor display.
- **Do not submit graphics from the Web. Even if they look fine on-screen, for the most part their resolution and/or quality is too low for publication.**

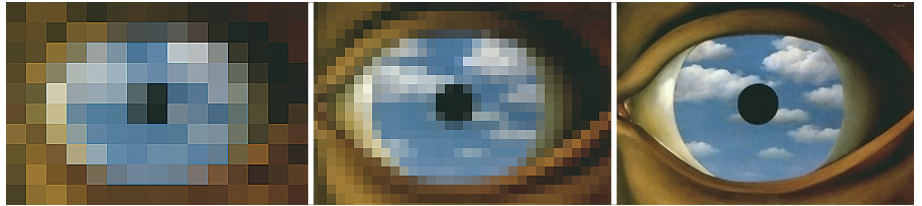
Digital art can be subdivided into two major categories: **raster art** and **vector art**. The differences between these categories are very important for publishing. The following several sections cover the main features and characteristics of raster and vector art.



# RASTER ART

## About Raster Art & Resolution

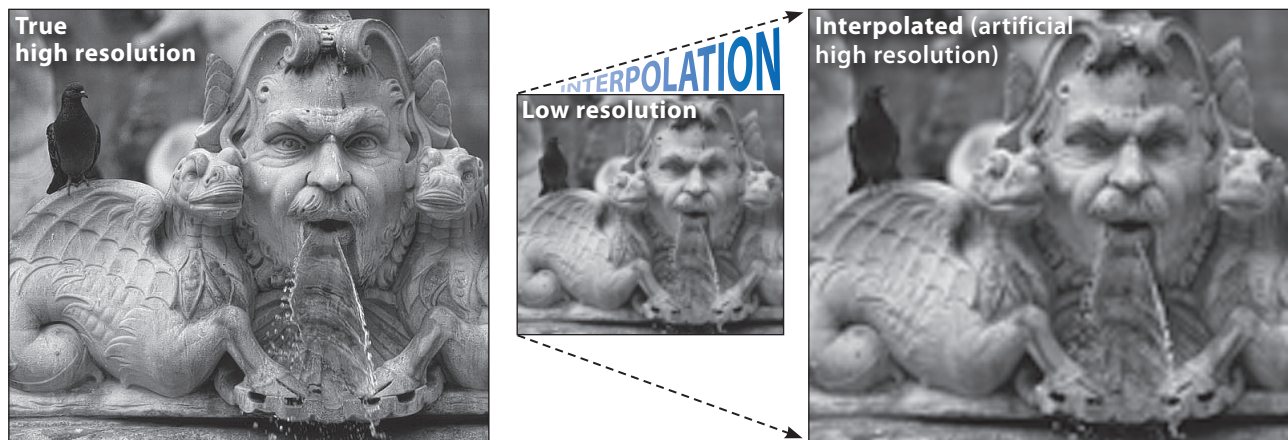
The image format best suited for reproducing photos and scans is called  **raster**, or pixel-based format. Raster images are composed of small dots or pixels. The dots are analogous to mosaic tiles: the more dots, the more visual information the image contains.



Thus the reproduction quality of raster images largely depends on the dots' density, or **resolution**, which is usually measured in **dpi** (dots per inch). The common computer monitors' and Web graphics' resolution is 72 dpi. Printing requirements are much higher; a standard printing resolution for halftones is 300 dpi. Low-resolution files are unacceptable.

Files exceeding the recommended resolution are acceptable, but they do not result in better reproduction quality. Files significantly exceeding the recommended resolution may simply be too large for you to work with or to send.

The number of pixels in a given image can be increased or decreased in many applications. Decreasing the number of pixels (a.k.a. **down-sampling**) results in a permanent loss of information. Increasing the number of pixels to bump up resolution, a.k.a. **interpolation**, "stretches" the images, but it cannot supply the missing information to a low-resolution image.



*Interpolation, or image "stretching", increases the image size and/or resolution by adding pixels artificially. This results in blurred images (compare the right-hand image to a true high-resolution image shown on the left).*

NOTE 🖱 **DO NOT** submit charts and maps in raster formats. Raster formats are not suited for creating charts, maps, diagrams, and other images involving fine lines and small type; see **VECTOR ART** for more info.

## Submitting TIF, JPG & Other Raster Files

Unless you have some experience in PhotoShop, please submit raster art without resaving or editing. We will convert color images to grayscale, if needed. We will crop the images – please provide instructions, preferably marked on your printouts or photocopies.

If you are processing scans or digital photos in PhotoShop:

**Settings** 🖱

Save the files in TIF, for PC, without compression.  
The resolution requirements are:

for **color or grayscale images** – **300 dpi**;

for **b/w line art images** – **1,200 dpi**.

Some applications show image dimensions in pixels only. If you would like an image to reproduce at 5'' x 7'', you need the pixel dimensions to be at least:

for **color or grayscale images** – **1,500 x 2,100 px**;

for **b/w line art images** – **6,000 x 8,400 px**.

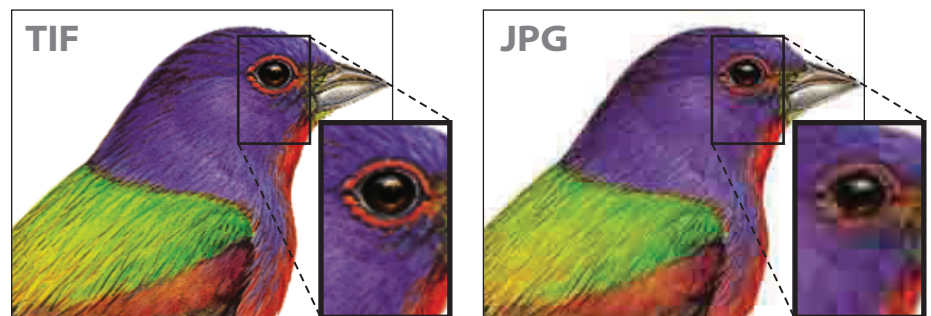
We accept the following raster formats:

**TIF** (or **TIFF**) is the preferred raster format.

**PSD, BMP, PNG, PICT**, and **raster EPS** files are usually acceptable.

**GIF** files are sometimes unacceptable because of their color palette limitations.

**JPG** (or **JPEG**) is generally acceptable. Though it is a very popular format due to its ability to compress to a very small file size, JPG compression scrambles the images: the higher the compression, **the smaller the file size and the lower the image quality**. In addition, JPGs deteriorate with every resave; if you intend to work on a JPG, save it first in a stable format like TIF or PSD before doing any work.



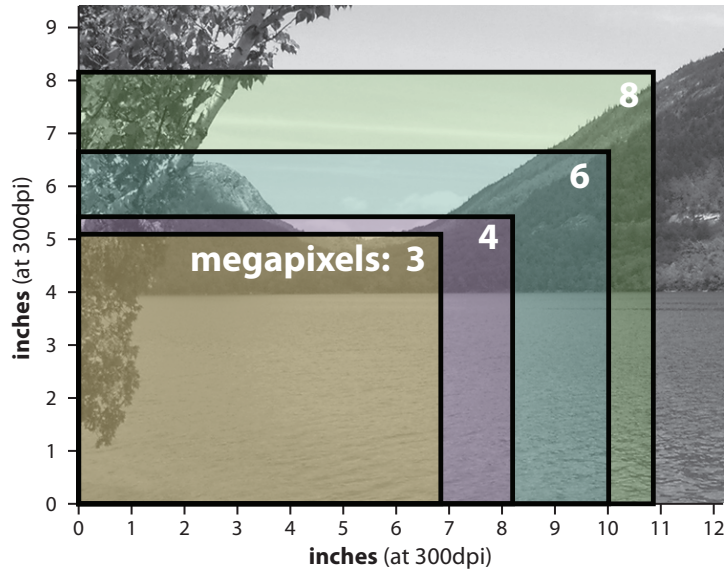
*Zoom in to check JPGs for major compression artifacts similar to those seen in the JPG on the right. Note the scrambling of details and the grid pattern typical of highly compressed JPGs, not seen in the intact TIF image on the left.*

When compression artifacts are present in other image formats, it is most likely because they have been converted from a JPEG file at some point in the image history.

## Digital Photo Requirements

*These are some basic tips for digital photography in relation to publishing. Please consult your digital camera manufacturer or manual for instructions on camera use and functions.*

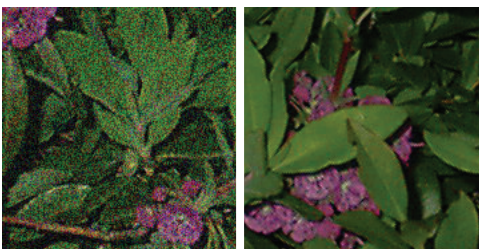
The resolution requirements for digital photographs are the same as for **other raster images**. A digital camera's resolution is usually measured in megapixels (1 megapixel = 1 million pixels). Below is a chart showing roughly how megapixels correspond to reproduced image sizes at 300 dpi resolution.



Usually a 3 or 4 megapixel photo has sufficient resolution for an average full-page illustration. However, if you plan to reproduce only a fragment of the image, you may need a higher megapixel image.

Here are some basic tips for digital photos:

- Use the highest available resolution setting on your camera; you can always get rid of the extra resolution later.
- Use optical zoom only. Avoid using digital zoom; it is based on **interpolation**.
- Digital photos are often generated in JPG format. Do not set your camera to use the high file compression; [see discussion of JPG format on p. 6](#). Similarly, if you intend to work on your photos, resave them in a stable format first (e.g., TIF).
- Keep the original photos if you are revising them or if you are placing them in other programs, like Word or PPT. We prefer to work with the original unedited photos and usually do not accept images placed in Microsoft applications, except as a reference.
- Inspect your images for digital noise. This is a digital photo artifact that appears as randomly scattered specks. Slight noise visible only at high magnification does not present a problem. Strong digital noise is unacceptable. It is usually the result of insufficient lighting or a mechanical problem.



*Digital noise*

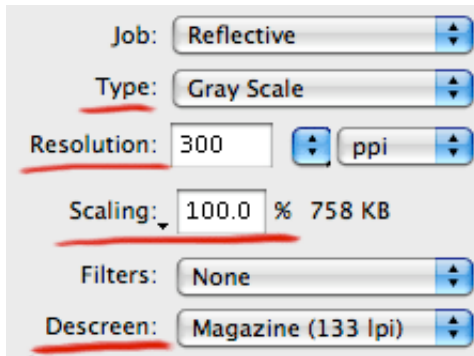
*Normal photo*



## Scanning Requirements

Scan the art according to [the settings on page 6](#). Save files in TIF without compression. The dimensions of the scanned images should be typically around 5" x 7" (12.7 x 17.8cm) for full-page figures. Check with your editor for the exact size.

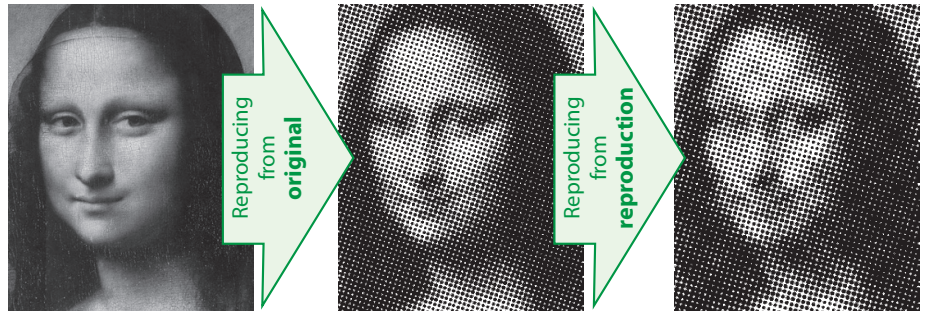
Scanning slides and transparencies is more demanding than scanning reflective materials. Though many scanners come with transparency adaptors, it is better to use scanners specialized in transparencies.



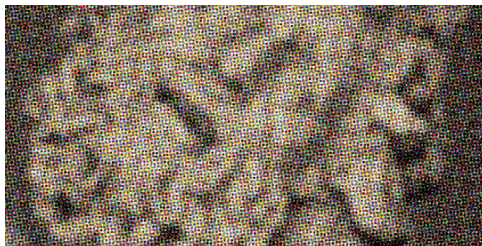
*Main features of a typical scanner interface. Some of the more important settings are underlined. If you are scanning from an original drawing or photo, descreen setting should be set to "None".*

## Scanning from Books & Other Printed Matter

Scanning **continuous-tone images from modern books should be avoided** if at all possible; **it leads to low image quality** due to half-tone screens used in printing. Offset printing became the industry standard shortly after 1900. It uses grid-based dot screens (a.k.a. half-tone screens) to reproduce continuous-tone images.



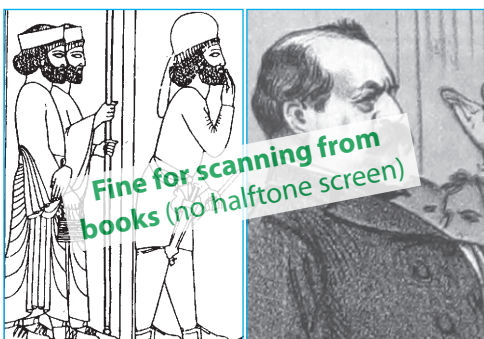
Halftone screens lead to some loss of visual information in the printed image. "Re-reproducing" printed images results in further quality loss.



*Typical moiré artifact in color reproduction*

In addition, the printer has to apply a new offset pattern to reproduce the image. It clashes with the first pattern, creating **moiré** artifact, which is unattractive and distracting for the readers. If you must scan from a book, avoid moiré by **descreening** during the scan (see settings at the top of the page). If the descreening does not work properly, it is better to omit it and ask PUP to filter the pattern out in Photoshop.

Reproducing halftones and color images from offset-printed books results in quality loss ranging from moderate to severe, depending on the screen density and the scan quality.



*Line art*

*Grayscale before 1900*

### NOTE 🖱️

1. There is no quality loss and no need to descreen when scanning **line art from any books or printed matter** (since line art does not involve halftone screens);
2. There is **no quality loss and no need to descreen when scanning any art from books published before offset** printing technology (generally before the early 1900s).

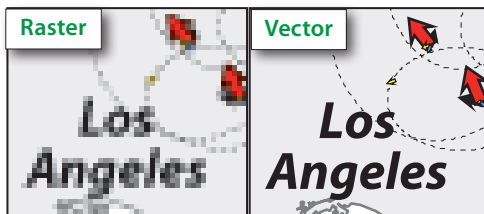


# VECTOR ART

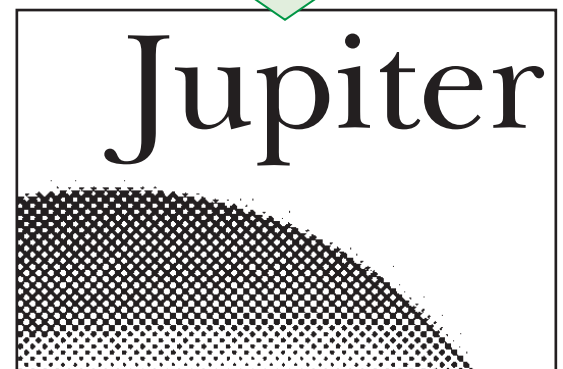
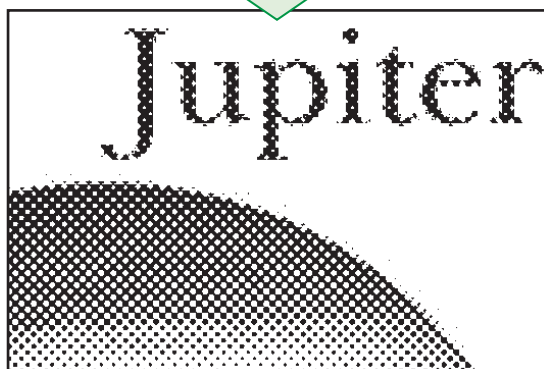
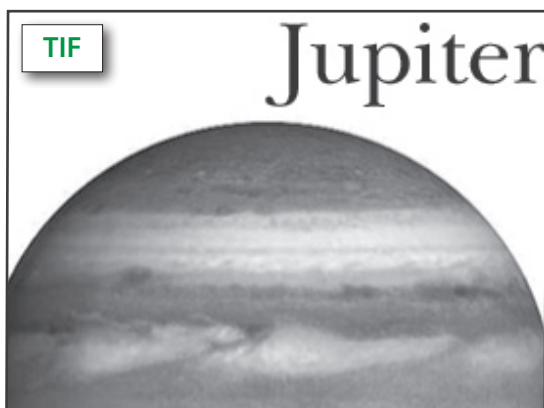
## About Vector Images

Vector format is used for creating charts, maps, logos, and other graphics requiring precision, especially with small type and fine lines. This format does not use pixels; it fundamentally differs from raster (pixel-based) format. Here are the basic advantages:

- Vector graphics are **resolution-independent**: they reproduce at the optimal capability of your printing device, and they can be scaled up and down indefinitely without losing resolution (unlike raster images, which lose information permanently after resizing).
- Vector graphics are very flexible and are generally much easier to edit than raster images. Text remains editable in vector format.
- Vector-based files **can combine vector elements with multiple placed raster images**. Each of the elements will print at its **optimum printing press capability**. This flexibility of vector-based art is very important for printing.



*Zooming in helps to identify vector art. As we zoom in, raster art becomes blurry and pixelated; in contrast, vector art becomes limitlessly clearer and sharper.*



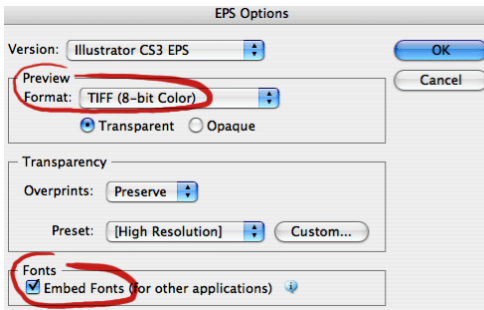
***A grayscale TIF vs EPS in offset printing.***

***TIF:*** the entire figure is in grayscale; the offset screen is applied to the type as well as the planet image.

***EPS:*** the imported planet image is in raster grayscale; the type is in vector format. Offset screen is applied to the image only; the type will print without offset screen. This is very relevant for illustrations with small type and fine lines, like maps and charts.

## Submitting EPS Vector Files

EPS is the only vector format accepted by PUP.\* EPS files created in Adobe Illustrator are preferred.



### Settings All EPS files need to be in CMYK color mode.

If your illustrations must be b/w, make sure that your colors are limited to black, shades of gray, and white.

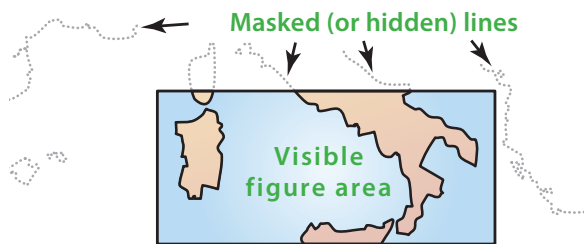
If your illustrations need to be in color, use the CMYK palette; any Pantone or custom colors should be converted to CMYK.

In the EPS saving dialogue, select: TIF preview; Embed fonts.

If you are unable to embed fonts, flatten ALL type. Note that the type will no longer be editable as text at that point.

You can use any common font formats. The preference order is:  
(1) OpenType, (2) PostScript, (3) TrueType.

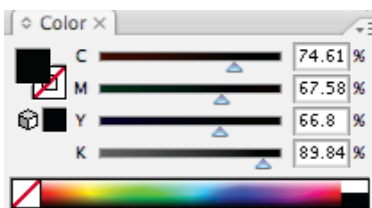
Delete invisible layers and all masked or hidden elements (e.g., lines, type) that extend more than 1 pica (4 mm) beyond the figure area.



Check if your EPS has any masked or hidden elements by using “SELECT ALL” command.

Check for hidden layers in the “LAYERS” window.

Use “clean” 100% blacks for most of the type and fine lines. If you start your image in CMYK color mode and select your colors carefully, your blacks will reproduce sharply as expected. If you convert an RGB file to CMYK, your type may appear to be black on-screen, but will likely be a mix of colors. This is a problem for type and fine lines in printing.



Sample mixed black reading. For clean black, the C, M, and Y sliders should be moved to 0%; the K slider to 100%

**A** *Mixed black  
as it appears  
on-screen*

**A** *Mixed black  
in print*

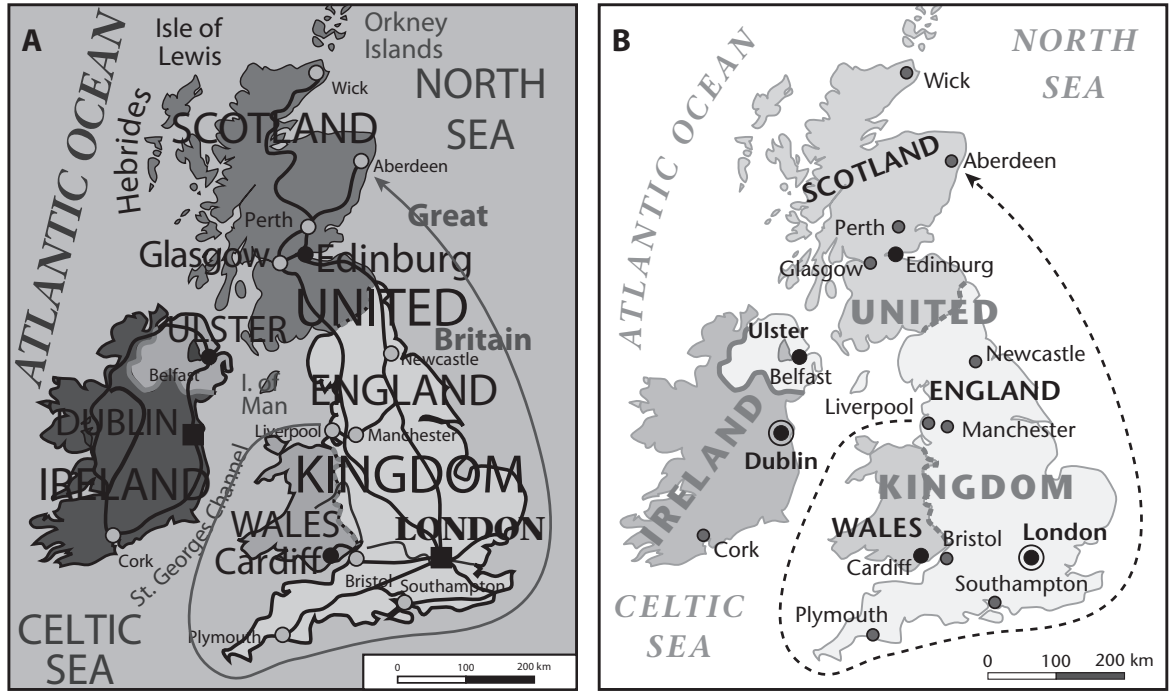
**A** *Clean black  
in print*

Mixed black usually occurs when a file created in a nongraphic program like MS Office (which works in RGB color mode only) is imported into a professional graphics application for printing. To clear mixed blacks: use “SELECT ALL” command, then “CONVERT TO GRAYSCALE” command.

\* Vector-based formats like .PS, .AI, and .PDF may be acceptable on a case-by-case basis; please confirm with the PUP illustration specialist.

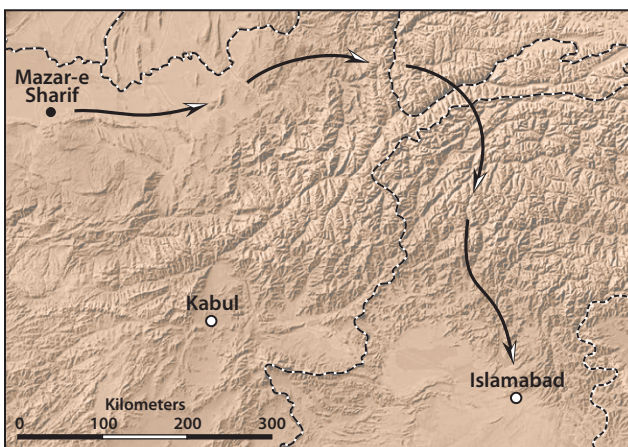
## Maps

An excessive amount of redundant information is one of the more common problems with map illustrations. Unlike atlas maps, illustration maps need to show only the information relevant for the text in a clear, reader-friendly style. Secondary information should be de-emphasized or omitted.



Map A shows some of the more common problems; map B shows how they may be resolved.

- Avoid setting very large type, but keep the labels large enough to be legible. Use **boldface** to convey a hierarchy of elements rather than extreme font size variations. Use one or two font families in a consistent style.
- Color maps converted to b/w often become unclear; adjust the tones for b/w reproduction.
- Keep ample contrast between the labels and the background; avoid overlapping labels, which are usually black, with the black lines used for borders, etc.

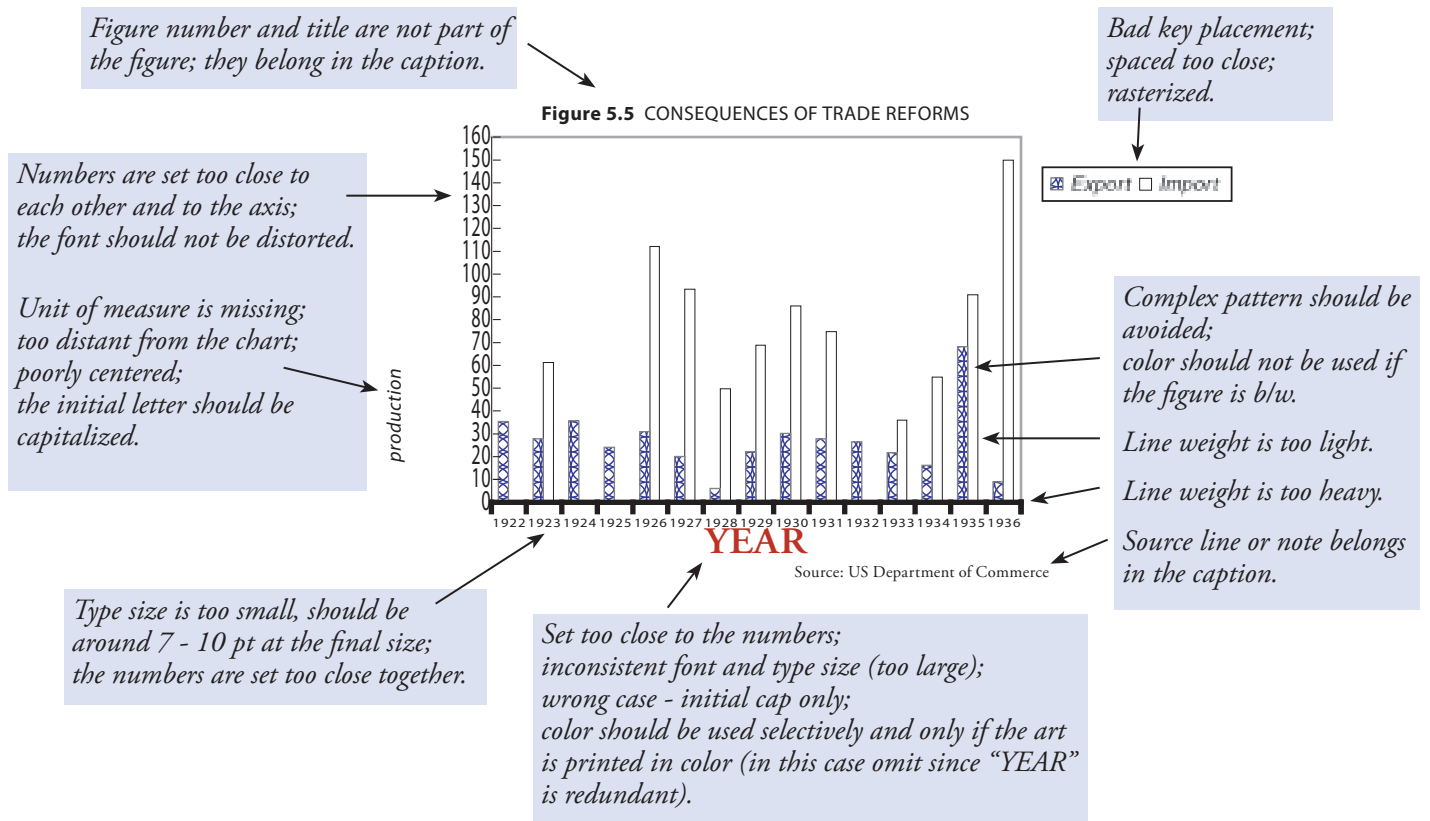


Though maps should be created in vector format, raster format can be more appropriate for some of the elements. The sample shown on the left contains an imported sepia colored terrain; its complex tonal transitions are well conveyed in raster format. The diagrammatic elements that require precision (the type, the border lines, the arrows, and other cartographic symbols) are in vector format.

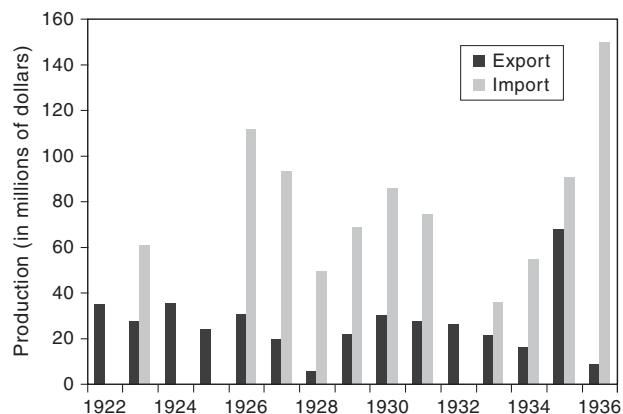
## Charts

MS Excel and many other applications used to create charts are not geared for press printing and publishing. However, these charts can usually be exported to PDF and then edited in a vector-based program.

Though the Excel interface is cumbersome, it is a good idea to minimize problems in Excel before the chart is exported to PDF. The following chart depicts many of the problems commonly encountered in charts and other graphics submitted by authors.



Below is a final chart; many of the problems were resolved in Excel. The exported PDF was opened and fine-tuned in Illustrator, then saved in EPS in a format acceptable for production.

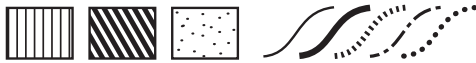




## CAMERA-READY ART

Though we prefer digital art, we also accept camera-ready art:

- Conventional glossy prints (glossies) produced from film/negatives. 5'' x 7'' (12.7 x 17.8 cm) or larger size glossies are preferred. Do not submit digital printouts of photos as final art if you can supply the actual digital art files.
- 35 mm slides and other transparencies. For high-quality reproductions, 4'' x 5'' or larger transparencies are preferred.
- Original art and documents without frames or glass.
- We sometimes accept loose pages from books, and other printed materials for scanning. Please read carefully about the drawbacks and limitations in [SCANNING FROM BOOKS](#), on p. 8.
- In some cases we accept quality laser printouts of charts and diagrams as camera-ready art. **Note the following limitations of this approach:**
  1. Reproduction quality will be somewhat lower than the properly generated digital version.
  2. Your art must be limited to b/w: it cannot contain any gray or color tones. You can use simple line patterns instead of gray tints and a variety of dashed and dotted lines (as well as varied line weights) to accentuate the differences between graph elements.
  3. Correcting laser printouts is complicated and time consuming; it requires reprocessing your figures and rescanning by an outside contractor (we do not scan artwork), which can delay your book's production.



*A few sample patterns and line style options for camera-ready charts and diagrams limited to b/w (no gray tones)*





Camera-ready art should be sent to us flat and packaged carefully to avoid damage.

Do not write or use any paper clips, staples, or gummed notes on the surface of any camera-ready art. Figure numbers should be lightly penciled on the back of camera-ready art. It is important that you place on the copies at this time any requests you wish to make concerning the art size (e.g., "can be smaller/larger"), cropping, and grouping.

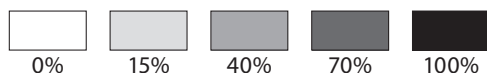
Please include printouts of slides output at 3 times their original size or larger. Printouts can be obtained at service bureaus (e.g., Kinko's)

## TIPS FOR AVOIDING COMMON PROBLEMS



Grid lines and tick marks		0.5 pt
Y and X axis		0.75 pt
Graph curves		1.0 pt
		2.0 pt

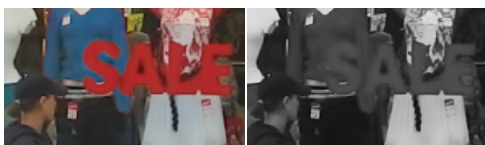
*Average suggested chart line weights.*



*Sample tint swatch. Try to separate light tints by at least 15%, dark tints by at least 25%.*

- Consistency is very important; however, it does not mean, for example, that all the lines within each illustration should be exactly the same. Some variation of elements makes illustrations more clear and interesting for the readers. Even if you are limited to b/w, you have many options, including a range of gray tones, patterns, as well as line weights and styles.
- The minimum recommended line thickness is 0.2 pt at final size for digital art, 0.4 pt for camera-ready art. Never use hairline rules. If you prepare illustrations larger than they will appear in the book, keep the reduction ratio in mind when selecting line weights.
- Wide graphs will be either reduced to a small size or turned sideways on the page. Try to reorganize the data; note that a book's vertical dimension is usually much greater than its horizontal one.
- Figures overloaded with data are often incomprehensible, especially when reduced to reproduction size. Consider breaking them into separate parts and moving lengthy labels into captions.
- Captions should not be included in the art; they will be typeset by the compositors along with the text. Anything that could be classified as a commentary or general information about the figure belongs in the caption. This includes the figure number and title, the source, the credit line, and the notes. Labels identify some part or an element of the figure; they are part of the figure.
- **If you are submitting line art as camera-ready art, make sure not to use any gray tones or color.**
- Keys should be placed within or below the chart or map. Please ensure that tone or pattern samples in maps and charts are clear and perceptibly different from each other. Note that dark grays tend to get darker in reproduction: grays of about  $\geq 80\%$  in print may be almost indistinguishable from 100% black.
- Set labels in a common, easily legible, sans serif font (Myriad or Helvetica, for example). Note that serif fonts work better for text, while sans serif fonts work better for labels.
- Avoid using all caps for all or most of the labels, or varying the font size significantly. Use boldface selectively for emphasis for a small ratio of labels within a figure. Font sizes should be consistent throughout the book's illustrations at **reproduction size**.

## FREQUENTLY ASKED QUESTIONS



*The visibility of the “SALE” sign is almost lost after conversion to grayscale.*

### ***Is it OK to submit color photos if there will be no color in my book?***

It is OK to submit color photos for b/w reproduction; however, keep in mind that contrasting colors may translate into very similar shades of gray, making the image unclear in some instances.

### ***The image I am submitting is centuries old and it does not look great; is it OK?***

Cracks in a fresco, faded photos, and other natural damage artifacts are fine. However, reproduction defects due to incorrect scanning, low resolution, etc., affect the validity of the images and the overall appearance of the book. As a responsible scholarly press, we care about the reproduction quality of historic materials no less than modern ones

### ***Will you accept maps/charts created in PhotoShop?***

If a historic map or chart is scanned and processed in PhotoShop, it is fine. If you are creating a new chart or map, it needs to be generated in a vector format; see [VECTOR ART, p. 9](#).

### ***I heard that JPEG images have quality problems; should I be concerned about submitting my art in JPEG format?***

Most of the JPEGs we receive from authors are fine. Try to zoom in on the image/s and check for major artifacts similar to the sample shown [on p. 6](#). Very minor artifacts will not be noticeable in print.

### ***Could you scan a print of a photo made from a file?***

Yes, but the quality will be much better if we could use the file.

### ***What is wrong with labels embedded in a photo?***

Labels embedded in a photo are very difficult to edit and they will not reproduce well; see [p. 9 for more details](#).

### ***Why do captions need to be submitted separately from figures?***

Figure captions and titles are typeset by book compositors in a very specific style. Illustrations are imported and placed on a page; compositors cannot make any changes to the illustrations.

### ***Do tables need to be submitted separately from figures?***

Yes, tables should be submitted separately from the figures.

### ***Do figures need to be created at final size?***

Creating the art at final size provides a good idea of how the illustration will appear in the book and it helps to keep a consistent style.

### ***What makes a good illustration?***

There are many types of illustrations: some play a central role; others simply help to clarify the text, or help to engage the reader. It is important to understand the role of each illustration and its impact on the overall appearance of the book. It helps to look at a variety of books with effective illustrations, and to follow the art guidelines.

# GLOSSARY OF COMMON ILLUSTRATION TERMS

**Adobe Illustrator** The leading application for creating and editing vector images, as **Adobe PhotoShop** is for raster images.

**AI** Native **Adobe Illustrator** file format with “.ai” file extension. AI is vector based.

**Bitmap** 1. Image Mode in PhotoShop limited to b/w without gray tones. 2. A common raster format (BMP) capable of reproducing millions of colors.

**Black-and-White (b/w)** 1. Without color. 2. Strictly black and white without intermediate gray tones.

**BMP** Microsoft graphics file format for raster images.

**Camera-ready art** Photographs, drawings, transparencies, and other hardcopy materials, properly prepared and ready for scanning.

**Caption** A general description of an illustration including the figure number and title. A caption is not part of the figure image; it is usually set below the illustration.

**CMYK** Color system based on four ink colors used in standard full-color press printing: **Cyan**, **Magenta**, **Yellow**, and **blackK**.

**Color mode (or color system)** A system of color supported by a computer application.

**Continuous-tone image** An image that has a virtually unlimited range of color or shades of grays.

**Descreening** Getting rid of the halftone pattern during the scanning to avoid moiré artifact.

**DPI** A system of measuring the resolution of images based on the density of **Dots Per Inch**.

**EPS** Encapsulated **PostScript** is a standard, vector-based graphic file format supported by all major page layout applications.

**File extension** A few characters at the end of a filename, following a period. The extension defines the type of file and helps the computer to select the correct application for handling the file.

**GIF** **Graphics Interchange Format**, a raster image format limited to 256 colors, used mostly for the Web.

**Halftone** A simulation of a continuous-tone image using a grid-based pattern of dots.

**Interpolation** Any image resizing that changes the number of pixels in an image. Usually refers to an undesired artificial increase of pixels meant to stretch the image size.

**JPG (or JPEG)** A common raster image format developed by the **Joint Photographic Experts Group**. The format is known for its ability to compress to very small file size at the expense of image quality.

**JPG compression artifact** Visible image damage caused by JPG compression.

**Label** A word or a call-out identifying a specific element or a detail of an illustration.

**Leader line** A line pointing from a label to a specific element or detail of an illustration. Leader lines may be plain or tipped with arrowheads.

**Line art (or binary art)** A type of graphic limited to b/w without any intermediate tones.

**Moiré** An undesired artifact usually produced by reproducing a halftone scanned from a book, a magazine, or a newspaper.

**Offset printing** The standard industrial printing technique employed for book printing.

**PDF** **Portable Document Format** is a standard format for exchanging platform-independent documents viewable using the free **Adobe Reader** software.

**Pixel** The smallest discrete component of an image.

**PNG** **Portable Network Graphics**, a raster image format that uses lossless data compression.

**Point (pt)** Standard unit of measure used for measuring line thickness and type sizes (1” = 72 pt)

**PostScript** A programming language instrumental for modern publishing, typography, and vector graphics.

**PSD** **PhotoShop Document** is a native **PhotoShop** file.

**Raster graphic** A resolution-based image composed of pixels.

**Resolution** A measure of the amount of image data per square inch or centimeter.

**RGB** The most common color system used by computer applications, based on **Red**, **Green**, and **Blue**.

**Serif fonts and sans serif fonts** Fonts with and without small lines or extra elements at the end of some of the character strokes.



**TIF (or TIFF)** **Tagged Image File Format** is a standard, raster graphic format supported by all major page layout applications.

**Vector graphic** A resolution-independent image file used primarily for charts, maps, and diagrams.